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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/672,880	09/29/2000	Tatsuhiko Nakada	500.39117X00	9478

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EXAMINER

JONES, PRENELL P

ART UNIT PAPER NUMBER

2667

DATE MAILED: 03/29/2004

4

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/672,880

Applicant(s)

NAKADA, TATSUHIRO

Examiner

Prenell P Jones

Art Unit

2667

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 9/29/2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3</u> . | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

2. Claims 1-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding independent claims 1, 8, 14, 21, 26 and 32, Applicant is claiming "an effective correlation peak" which is vague. Claims 2-7, 13-20, 27-31 and 33-36 depend on claims 1, 8, 14, 21, 26 and 32 therefore, they are rejected for the same reasons that claims 1, 8, 14, 21, 26 and 32 are rejected.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al in view of Isaksson et al and Keevill et al.

Regarding claims 1, 3-5, 8, 10, 11, 13, 14, 16, 17, 20, 21, 23, 24, 26, 28, 29, 31, 32 and 34-36, Sato discloses (Abstract, col. 1, line 27 thru col. 4, line 38) a receiver for OFDM modulated transmission signal, wherein there includes sample sequence data for determining a cross-correlation calculator, calculate cross-correlation values,

Art Unit: 2667

synchronizing symbols are added to frames, detecting synchronizing patterns in sample sequence, sample clock sequence, controlling clock frequency in response to time intervals, (col. 7, line 44-58, Figs. 1-5, col. 9, line 21 thru col. 10, line 50) a controllable clock generator used to produce receiver sampling clock sequence with controllable sampling data, (col. 11, line 7 thru col. 13, line 55) reproductions of synchronizing symbols are synchronization patterns, production of an auxiliary/main synchronizing symbols, and it is preferred that synchronizing symbol produces a sharp autocorrelation peak, voltage controlled oscillator, (col. 14, line 19-54) frame/symbol clock sequences (frame/symbol timing), (col. 11, line 43-59) a selector that compares correlation values with respect to their peaks. Sato is silent on inter-symbol interference/reflector wave received from predetermined symbols and peak detector. In analogous art, Isaksson discloses (Abstract, Figs. 4, 7, 11, 14, 15, 18, 21, 28, a multi-carrier transmission system associated with OFDM signaling wherein the architecture includes (col. 8, line 39-50) system controller, symbol detection, sampling clock controlled by frame time estimator, (col. 11, line 30 thru col. 14, line 55) correlator and peak estimator (correlation arithmetic), transmitter/receiver devices, inter-symbol interference peak detector for detecting peak levels, sampling clock generated by a voltage controlled crystal oscillator, (col. 6, line 49-64) predefined symbol carriers define inter-symbol interference, and Keevill discloses (Abstract, col. 4, line 43 thru col. 6, line 67) a receiver for multi-carrier signals that are transmitted by OFDM which includes estimation/correction circuit, wherein the architecture includes correlation circuits that have peak tracking, (fig. 3) difference signal for samples, first symbol carrier and inter-

Art Unit: 2667

symbol interference carrier, (fig. 7, col. 11, line 4 thru col. 15, line 67, col. 20, line 55 thru 21, line 67) peaks are detected by peak detectors, FFT windows necessary for signal reconstruction, FFT window synchronization circuit and frame/symbol periods. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to be motivated to implement correlation arithmetic operations that includes the effect of defined inter-symbol interference by symbols and peak detectors as taught by the combined teachings of Iasaksson and Keevill with the teachings of Sato for the purpose of further processing/managing the transmission/reception associated with OFDM signaling.

Regarding claims 2, 9, 15, 22, 27 and 33, as indicated above, Sato discloses (Abstract, col. 1, line 27 thru col. 4, line 38) a receiver for OFDM modulated transmission signal, wherein there includes sample sequence data for determining a cross-correlation calculator, calculate cross-correlation values, synchronizing symbols are added to frames, controlling clock frequency in response to time intervals, (col. 7, line 44-58, Figs. 1-5, col. 9, line 21 thru col. 14, line 54) a controllable clock generator used to produce receiver sampling clock sequence with controllable sampling data, reproductions of synchronizing symbols are synchronization patterns, production of an auxiliary/main synchronizing symbols, voltage controlled oscillator, frequency controller, frame/symbol clock sequences (frame/symbol timing), (col. 11, line 43-59) a selector that compares correlation values with respect to their peaks. Sato further discloses (col. 14, line 19-44) frequency controller suspends control of the controllable oscillator.

Regarding claims 6, 18, 19 and 30, as indicate above, Isaksson discloses (Abstract, Figs. 4-28, a multi-carrier transmission system associated with OFDM signaling wherein the architecture includes (col. 8, line 39-50) system controller, symbol detection, sampling clock controlled by frame time estimator, (col. 11, line 30 thru col. 14, line 55) correlator and peak estimator (correlation arithmetic), transmitter/receiver devices, inter-symbol interference peak detector for detecting peak levels, sampling clock generated by a voltage controlled crystal oscillator. Isaksson further discloses (col. 23, line 56 thru col. 24, line 50) the interference in minimized with respect to the carrier modes.

Regarding claims 12, 25 and 35, as indicated above, Keevill discloses (Abstract, col. 4, line 43 thru col. 6, line 67) a receiver for multi-carrier signals that are transmitted by OFDM which includes estimation/correction circuit, wherein the architecture includes correlation circuits that have peak tracking, (fig. 3) difference signal for samples, first symbol carrier and inter-symbol interference carrier, (fig. 7, col. 11, line 4 thru col. 15, line 67, col. 20, line 55 thru 21, line 67) peaks are detected by peak detectors, FFT windows necessary for signal reconstruction, FFT window synchronization circuit and frame/symbol periods. Keevill further discloses (col. 1, line 23 thru col. 3, line 64, col. 6, line 16-67) associated with OFDM signaling is the time domain relationship between signals and inter-symbol interference, and peak tracking determined with respect to time.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prenell P. Jones whose telephone number is 703-305-0630. The examiner can normally be reached on Monday thru Friday from 9:00-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on 703-305-4378. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Prenell Jones 

March 18, 2004


CHI PHAM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600 3/22/04